AMENDMENTS TO THE CLAIMS

Claims 1 - 47. (canceled)

48. (Currently Amended) A method of fabricating an image sensor, the method comprising:

providing a substrate comprising a plurality of photosensitive regions having photo sensors, and an upper substrate layer;

providing a color filter array on top of the upper substrate layer;

applying a sacrificial material to the upper substrate layer;

forming support molds in the sacrificial material;

forming lens molds in the sacrificial material;

forming supports by filling the support molds with a support material;

forming a first micro-lens array having first micro-lenses by filling the lens molds with a first micro-lens material; and

removing the sacrificial material.

49. (Original) The method of claim 48 wherein said step of forming the support molds further comprises:

applying a sacrificial photo resist to the sacrificial material;

applying a mask to the sacrificial photo resist and exposing support openings in the sacrificial photo resist; and

etching the sacrificial material by applying an chemical etching solution to form support molds by etching through the support openings.

50. (Original) The method of claim 49 wherein the chemical etching solution is an anisotropic etching solution.

51. (Currently Amended) The method of claim 48 wherein the step of forming the lens molds further comprises:

applying a sacrificial photo resist to the sacrificial material;

applying a mask to the sacrificial photo resist and exposing sacrificial resist openings in the sacrificial photo resist;

etching the sacrificial material by applying ~~an~~ chemical etching solution to form lens molds by etching through the sacrificial resist openings; and

applying a rinse to stop the etching process.

52. (Original) The method of claim 51 wherein the chemical etching solution is an isotropic etching solution.

53. (Original) The method of claim 48 wherein the step the forming the support molds further comprises etching the support molds in the sacrificial material by controlled laser etching.

54. (Original) The method of claim 48 wherein the step the forming the lens molds further comprises etching the lens molds in the sacrificial material by controlled laser etching.

55. (Original) The method of claim 48 wherein said sacrificial material degrades upon heating to a degradation point, and the step of removing the sacrificial material comprises heating the sacrificial material to at least the degradation point.

56. (Original) The method of claim 48 further comprising:

forming vacuum channels through the first micro-lens array, wherein the distal ends of the vacuum channels are adjacent the sacrificial material; and

using the vacuum channels to remove residual particles that remain in the image sensor after the step of removing the sacrificial material.

57. (Original) The method of claim 56 wherein the vacuum channels are formed prior to the step of removing the sacrificial material.

58. (Original) The method of claim 56 wherein the step of forming vacuum channels further comprises:

applying a vacuum photo resist to the first micro-lens array;

masking the vacuum photo resist and developing vacuum openings therein; and

etching the first micro-lens array through to the sacrificial material with a chemical etching solution.

59. (Original) The method of claim 58 wherein the chemical etching solution is an anisotropic etching solution.

60. (Original) The method of claim 48 wherein said removing the sacrificial material comprises treating the sacrificial material with chemical resist solvents.

61. (Original) The method of claim 48 wherein the support material is the first micro-lens material.

62. (Currently Amended) A method of fabricating an image sensor, the method comprising:

providing a substrate having a plurality of photo sensors;

forming one or more supports having distal and proximal ends wherein the distal ends are proximate the substrate; and

forming a first micro-lens array in association with the substrate, the first micro-lens array having micro-lenses corresponding to said photo sensors and supported by the supports at said proximal ends wherein a cavity is formed between ~~below~~ said first micro-lens array and ~~above~~ said substrate.

63. (Original) The method of claim 62 further comprising the step of forming a second micro-lens array above the substrate and below the first micro-lens array wherein the distal ends of the supports are adjacent to the second micro-lens array and the cavity is formed above said second micro-lens array.

64. (Currently Amended) A method of fabricating an image sensor, the method comprising:

providing a substrate comprising a plurality of photosensitive regions having photo sensors, and an upper substrate layer;

applying a sacrificial material above the upper substrate layer;

forming lens molds in the sacrificial material;

forming a micro-lens array having micro-lenses by filling the lens molds with a micro-lens material; and

removing the sacrificial material.

65. (Previously Presented) The method of claim 64 further comprising:

forming support molds in the sacrificial material; and

forming supports by filling the support molds with a support material.

66. (Previously Presented) The method of claim 65 wherein said step of forming the support molds further comprises:

applying a sacrificial photo resist to the sacrificial material;

applying a mask to the sacrificial photo resist and exposing support openings in the sacrificial photo resist; and

etching the sacrificial material by applying an chemical etching solution to form support molds by etching through the support openings.

67. (Previously Presented) The method of claim 66 wherein the chemical etching solution is an anisotropic etching solution.

68. (Currently Amended) The method of claim 64 wherein the step of forming the lens molds further comprises:

applying a sacrificial photo resist to the sacrificial material;

applying a mask to the sacrificial photo resist and exposing sacrificial resist openings in the sacrificial photo resist;

etching the sacrificial material by applying ~~an~~ chemical etching solution to form lens molds by etching through the sacrificial resist openings; and

applying a rinse to stop the etching process.

69. (Previously Presented) The method of claim 68 wherein the chemical etching solution is an isotropic etching solution.

70. (Previously Presented) The method of claim 64 wherein the step the forming the lens molds further comprises etching the lens molds in the sacrificial material by controlled laser etching.

71. (Previously Presented) The method of claim 64 wherein said sacrificial material degrades upon heating to a degradation point, and the step of removing the sacrificial material comprises heating the sacrificial material to at least the degradation point.

72. (Previously Presented) The method of claim 65 wherein the step of the forming the support molds further comprises etching the support molds in the sacrificial material by controlled laser etching.

73. (Previously Presented) The method of claim 65 further comprising:

forming vacuum channels through the micro-lens array, wherein the distal ends of the vacuum channels are adjacent the sacrificial material; and

using the vacuum channels to remove residual particles that remain in the image sensor after the step of removing the sacrificial material.

74. (Previously Presented) The method of claim 65 wherein the support material is the micro-lens material.